

BUSINESS MODELS FOR GREEN BUILDINGS

Real estate actors around the globe show the way



PEEB
PROGRAMME FOR
ENERGY EFFICIENCY
IN BUILDINGS



GREEN BUILDINGS¹ MAKE BUSINESS SENSE².



Lower operating costs

Green buildings save 14% on costs within just five years of operation.



Decreasing payback times for making a building green

While payback periods mostly range between 5 and 10 years, there are now more than a third of green projects with payback periods of less than 5 years.



Higher asset values

One third of green building owners and project developers say that their green asset is worth 10% more than a traditional building.



Better health and well-being

Green buildings provide high indoor air quality and comfort - an increasing market demand of clients and regulation, especially in areas with high air pollution.

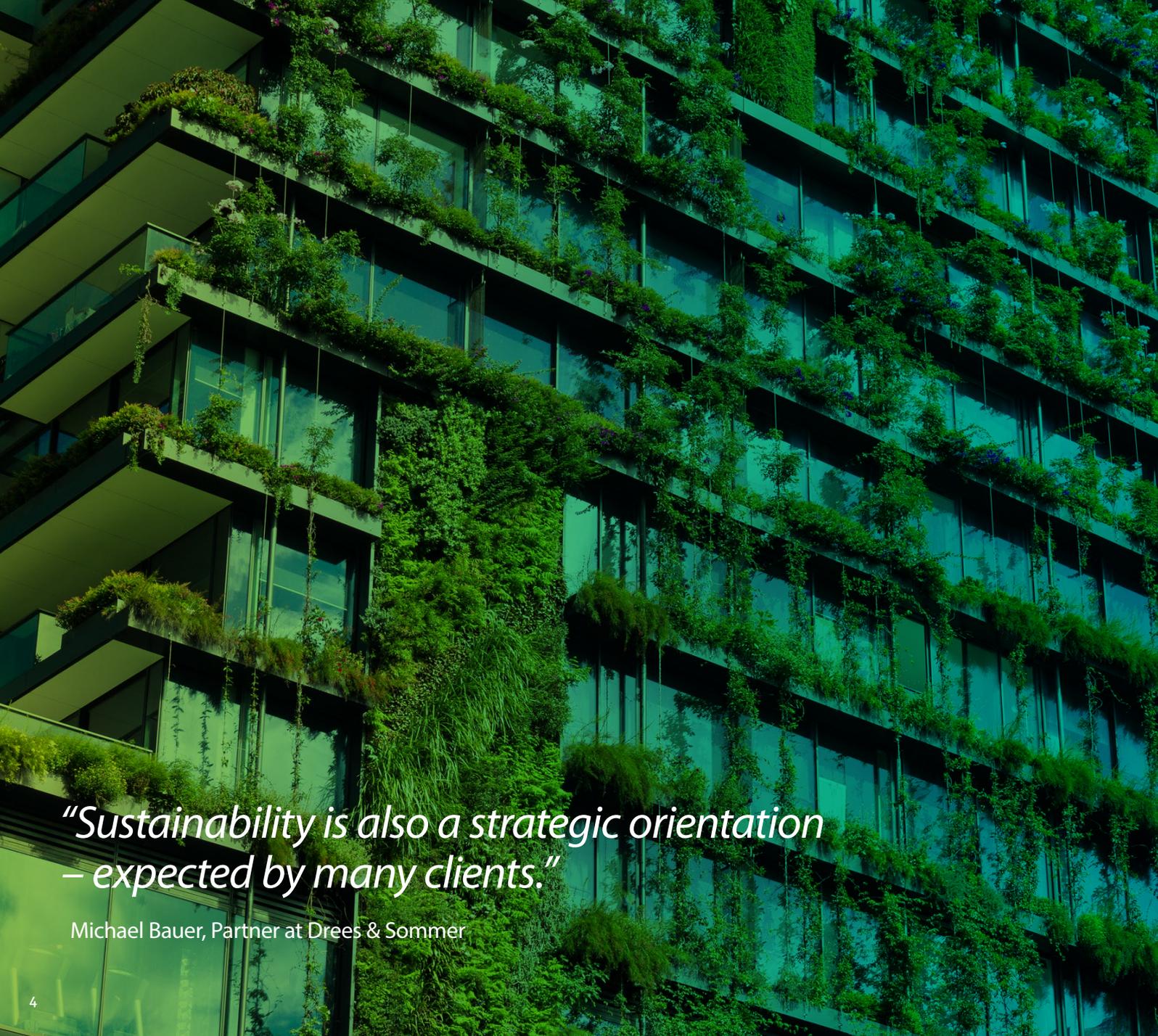


Increased quality assurance

Heightened scrutiny for green buildings in the certification process and monitoring of energy performance means that certification – albeit not a must – is a sign of quality of the overall development.

¹ Green buildings encompass energy efficiency measures as well as other environmental measures such as water efficiency and mobility solutions.

² All data from World Green Building Trends 2018



*“Sustainability is also a strategic orientation
– expected by many clients.”*

Michael Bauer, Partner at Drees & Sommer

GREEN BUILDINGS ARE TRENDING.

Green buildings are already on the way to becoming global practice for residential and non-residential buildings. Real estate actors around the globe have developed business models to build profitable businesses around green buildings.

“New construction needs to address the needs of future generations,” says Michael Bauer, Partner at Drees & Sommer, one of Europe’s leading real estate consulting companies. “In buildings with lifetimes of 40+ years, future customers place increasing value on environmental performance,

health and well-being. To achieve high quality buildings, energy efficient building design and technologies are essential tools. Certification is one of the signs of quality that translates technological achievements into economic value for the developer. This often offsets the additional time and cost required to achieve certifications”

Commercial and office buildings in central urban locations currently make up the vast majority of certified green buildings in Germany³. The trend is similar in other countries. Businesses want to reduce their occupancy costs (which include energy costs) and increase productivity – and green buildings can help them achieve both.

³ BNP Real Estate Investment Market Green Buildings.

According to Michael Bauer, *“Profitability remains the main risk from the project developers and real estate companies’ perspective.”* Yet while higher costs (actual or perceived only) are still a top barrier, this constraint is actually decreasing in importance.⁴

“Sustainability is also a strategic orientation – expected by many clients. To attract the increasing number of sustainable investors using sustainability criteria to place their investments, demonstrating detailed knowledge and management of energy performance helps real estate companies attract additional financing” – according to Michael Bauer. As pension funds and other investors are looking at greening their portfolio, the trend will unfold dramatically in the coming years.

The Programme for Energy Efficiency in Buildings (PEEB) developed this publication to serve as an inspiration for actors along the green building value chain to adapt and expand their activities. We would like to thank the many contributors from the buildings and construction industry for their valuable insights in the development of this publication.

Have a look!

⁴ Only 49% of respondents of the World Green Buildings Trends 2018 review state that high actual or perceived costs are still a top barrier, but this is down from 76% in 2012!

GREEN BUILDING BUSINESS MODELS

Green buildings provide better value over their life cycle – for investors, developers, owners, and users. Six business models, using real life case studies from around the world, show how higher investment costs can be recouped by adapting and extending business activities.



Model 1: Developing properties for rental



Model 2: Achieving lower prices through pre-fabrication



Model 3: Using public support programmes for energy efficient social housing



Model 4: Building collectively through cooperative housing



Model 5: Guaranteeing energy performance through energy supply contracting



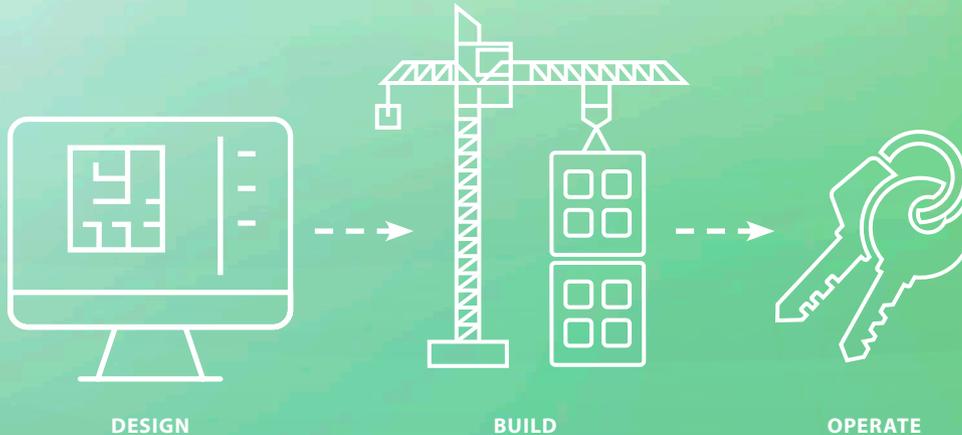
Model 6: Building with low carbon materials.



MODEL 1: **DEVELOPING PROPERTIES FOR RENTAL**

A developer not only manages the design and construction of a residential or non-residential property for sale but also operates the property.

The developer then recovers the additional initial investment during the energy efficient operation phase of the building.



MIRVAC | AUSTRALIA

Core activities

Mirvac is developing, investing and operating its first build-to-rent property in Sydney, Australia – a model that has been increasingly interesting for real estate developers from around the world. Build-to-rent creates a new asset class with long-term predictable cash flows that send a positive signal to other investors; and allows developing business activities further.

Mirvac will start operating its first development with 315 apartments in mid-2020 and expects to extend this business line dramatically in the next 5-7 years.

Value proposition

Build-to-rent caters to a new type of customers in the Australian homeowner centered market, proposing:

- Purpose-built high-quality rental housing with low operating costs due to its energy efficient features.

- Access to clean energy technologies for tenants, usually limited to homeowners (passive design, live energy consumption display and monitoring, LED lighting, energy efficient appliances, improved glazing, and on-site PV generation).
- Central location and accessibility by public transport, while providing car and bike sharing solutions.
- High tenant security due to professional management.

Apartments are rented with an average premium of 5% above market rates. Utilities (gas, water, electricity) remain at the charge of the customers. All additional costs for high-energy performance and amenities are recovered through the premium.



Customers

Typical customers are:

- Young urban professionals, young families choosing to rent while saving up for buying a house.
- Long term renters: young to middle aged families who decide on renting in a central location rather than living in remote suburbs where they could afford to buy, and
- People who sell their primary residence when downsizing, releasing their equity and moving to a more centrally located building with better amenities and services.

Financing

Mirvac operates through investing its own equity as well as external funds. The Clean Energy Finance Corporation (CEFC) has taken a 30% equity investment (50 million AUD) in the development of Mirvac's first build-to-rent development, driven by its interest to create a new market and the possibility to guide tenants' behavior towards more energy efficient habits. This is another sign of the growing interest of investors to invest in green buildings portfolio, and an opportunity to diversify and access new financing.



“Build-to-rent allows us to think much more about the life cycle of the asset, for example in terms of operating efficiencies.”

Adam Hirst, General Manager, Build-to-Rent





9 FROSTERLEY

NMG BENEFITS

FEZEKA BUSINESS SERVICES INVESTMENT

LION OF AFRICA

MEGA PETROLEUM RESOURCE

TIRHANI AUCTIONEERS

SIRAGO REAL ESTATE

TIRHANI CONSULTING

"We believe that green building gives us a competitive edge."

Rudolf Pienaar, Chief Development and Investment Officer
at Growthpoint Properties

GROWTHPOINT | SOUTH AFRICA

Core activities

Growthpoint is a Real Estate Investment Trust (REIT) that develops, owns and manages innovative and sustainable property solutions across South Africa with a current portfolio of 447 office, retail and industrial buildings. Green buildings are major assets for Growthpoint as they are functionally and financially more attractive while making a positive impact on climate change. This supports the sustainability of the business, which is recognized as the leading developer of green buildings in South Africa. Besides developing for their own balance sheet, Growthpoint also develops buildings for third parties and recently completed several green certified customer build developments for sale to third parties.

Value proposition

Growthpoint's green offices have the following advantages for their clients:

- Reduced cost of occupation for businesses
- Increased staff productivity, attraction and retention of talent
- Features such as renewable energy installations ensure there are no interruptions in services related to utilities such as water and electricity.
- Possibility to subscribe to a partnership program where any financial savings from decreased usage of energy and water benefit both the tenant and Growthpoint.





GROWTHPOINT'S GREEN BOND EXPERIENCE (2018):

- Generated a lot of interest in the absence of dedicated green funds in South Africa
- Resulted in a more than three times oversubscription of the bond
- Confirmed sustainability branding of Growthpoint
- Diversified investor base (mostly South African, one international)
- Offered same conditions as for normal bonds but included additional disclosure on environmental metrics (energy, water, waste and carbon emissions) according to the Green Bond Framework
- Requires additional measurement of metrics for reporting to bond subscribers, mostly already integrated into regular business activities.

Customers

Growthpoint's main customers are major companies that demand (certified) green buildings when considering to rent an office space. Those are usually long-term and trustworthy clients, resulting in low vacancy rates for green rated portfolios and positive impact on Growthpoint's balance sheet.

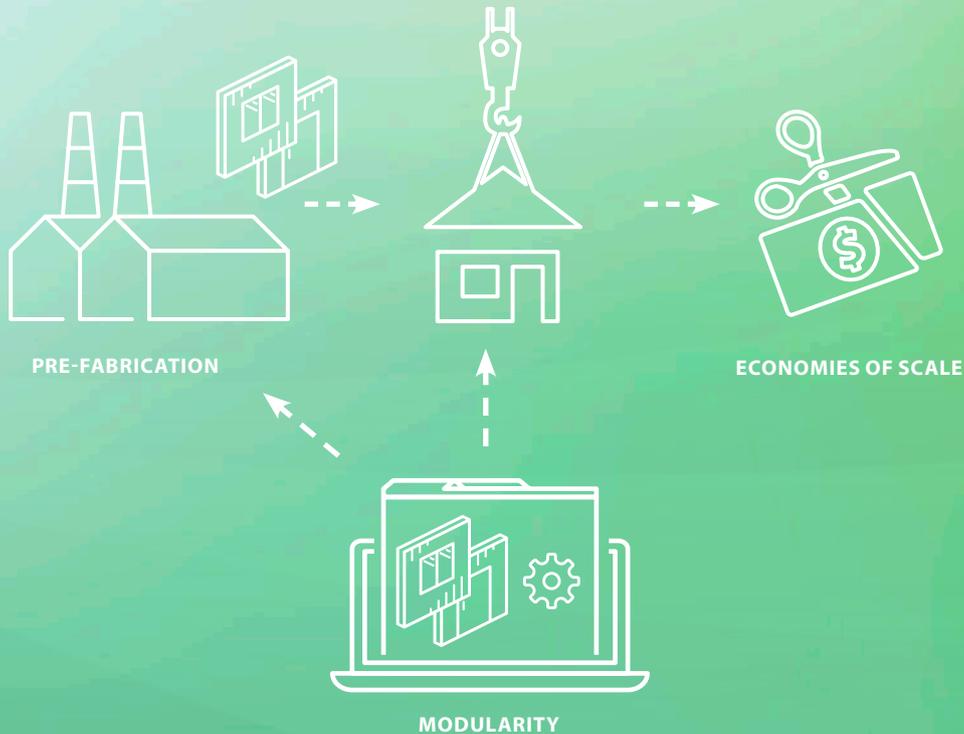
Financing

As a REIT, Growthpoint develops and rents office spaces, and distributes the income as dividends to its shareholders. It additionally raises capital through (green) bonds.



MODEL 2: ACHIEVING LOWER PRICES THROUGH PRE-FABRICATION

Pre-fabrication of energy efficient housing components allows for reducing construction and installation costs through decreased costs in production.



SEKISUI HOUSE | JAPAN

Core activities

Sekisui House develops pre-fabricated residential buildings for sale. In 2018, it built more than 8000 “green first zero” houses, representing 79% of its total detached housing production. These green first zero houses meet the national energy efficiency regulation “net zero energy house” and annually produce more energy than they consume.

Value proposition

Sekisui House offers its customers:

- High comfort with low costs: Sekisui homes have a high energy and environmental performance at a comparatively low upfront cost and with low operating cost
- Modularity: To cater for individual preferences, pre-fabricated modules can be combined according to taste
- After-sales services: Sekisui offers an “after sales service”, including data and energy management as well as maintenance support.

Sekisui also offers net zero energy apartments for short-term rental as part of a government effort to make the experience of living in a high comfort environment tangible before purchasing

Customers

The market segment is middle to high income. Typical customers are families that acquire single-family detached housing in city and countryside settings, followed by more aged customers who move into a retirement property.

Financing

Its operations are financed mainly through loans with its commercial bank partners.





CO₂ emissions impact

Sekisui's net zero energy houses with a lifetime of 90 years have life cycle CO₂ emissions of only 183 ton of CO₂ vs 483 ton of CO₂ per household in comparison to a traditionally built house. Most savings incur in the operational energy consumption stage.

Did you know?

Sekisui started buying up surplus electricity produced by the zero net energy buildings of their customers at a fixed tariff per kWh after the ending of the governmental feed in tariff period. This purchased electricity will serve Sekisui to compensate its scope 1, 2, and 3 emissions⁵ occurring during business activities. Sekisui is a signatory of the Science-Based-Targets⁶ initiative that rallies private sector actors around the Paris Agreement objectives.

⁵ Scope 1: Direct emissions (Emissions from combustion and volatile gases)

Scope 2: Indirect emissions (Emissions from purchased energy)

Scope 3: Upstream and downstream value chain

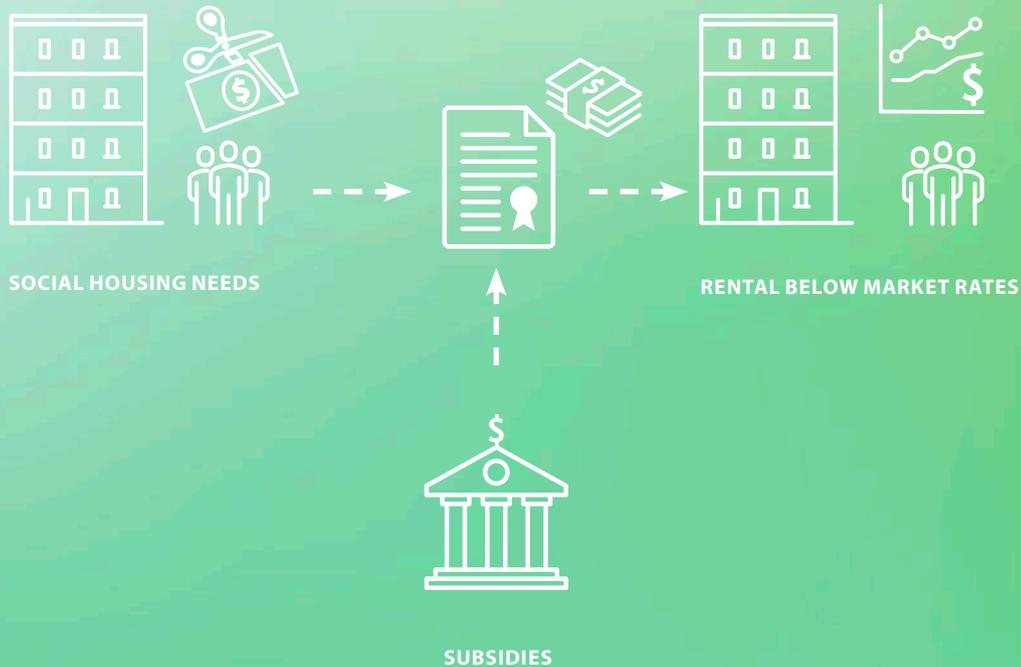
⁶ The Science Based Targets initiative is an international effort to encourage companies to set emission reduction targets while boosting companies' competitive advantage in the transition to the low-carbon economy.





MODEL 3: USING PUBLIC SUPPORT PROGRAMMES FOR ENERGY EFFICIENT SOCIAL HOUSING

Using dedicated public funds to bring down overall investment costs makes subsidized housing built according to the highest energy performance standards possible.



ABG FRANKFURT HOLDING | GERMANY

Core activities

ABG Frankfurt Holding is Frankfurt's largest housing association. It builds and manages more than 52 000 residential and 30 000 commercial/other properties across different customer segments, pursuing the same ambitious level of energy performance (exceeding mandatory regulation) for all its properties. Continuous technological updating and retrofitting of its properties are part of its business practice.

ABG foresees to invest an additional 2 billion EUR in the 2018-2022 period into new builds, with at least 40% being subsidized rental units. ABG also acts as a developer or engineering firm for contracted projects.

Customers and value proposition

Customers range from households depending on government transfer services to high-income households. In addition to renting from a housing association with a commitment to energy and resource efficiency, ABG offers its customers:

- Low and predictable utility costs
- High quality living conditions through advanced building standards (i.e. high level of sound proofing, no mold problems)

Financing

For its investments, ABG relies on a combination of roughly 1/3 own equity and 2/3 bank loans. Using optimised design of its new builds, additional costs for energy efficient developments are kept at 3-4%, mostly due to insulation or windows. These additional investment costs specific to each project are recouped through a premium on the rental price of the units in that project. The premium is equally applied to subsidized and market price apartment units. In the case of subsidized rental units, both rent per square meter and premiums are limited by governmental authorities. ABG, as any other developer of new rental properties, is in turn eligible for subsidies, including for high energy performance. In Frankfurt's competitive housing market, the fixed subsidized housing rental price was more than 50% below the market rate in 2019.



© Jochen Müller



© ABG Frankfurt Holding

ABG on passive house standards and the future of buildings & construction

ABG built and now operates more than 3000 rental (subsidized) passive house standard apartment buildings, many of which are retrofits. This reduces thermal energy needs to approximately 15 kWh/a/m², a more than 50% saving in comparison to projects built according to the buildings energy efficiency directives. In many passive house apartment buildings, the annual heating bill is so low ABG does not actually bill it because administrative costs would be higher.

Frank Junker, CEO of ABG Frankfurt Holding, recommends other developers „to look one step ahead and construct sustainably in order to conserve the planet’s finite energy sources“.





MUTUAL HOUSING | USA

Customers and value proposition

Mutual Housing is the driving force behind the nation's first net zero energy rental housing community for agricultural workers, now counting almost 100 homes offering high comfort and low utility cost.

Financing

Mutual Housing financed the developments, including an estimated 10% additional cost for reaching net zero energy standard (NZE), through a variety of sources: Rebates for energy efficiency measures, loans with favorable conditions due to its high energy performance, as well as equity investors through federal and state tax credit programs incentivize private investment into affordable housing. It repays the debt through rental payments. Rental rates for affordable housing are capped at around 20% below the market rate in the respective neighborhood but that cap includes rent and utilities. With a decreased cost for utilities due to NZE status, the rent may be higher – effectively giving the possibility to developers to

recover additional costs for EE measures through this margin.

While the development did not reach net zero energy status in the first year of operation, it is getting closer ever since due to adjustments such as resident education or the additional introduction of energy saving and monitoring technology.



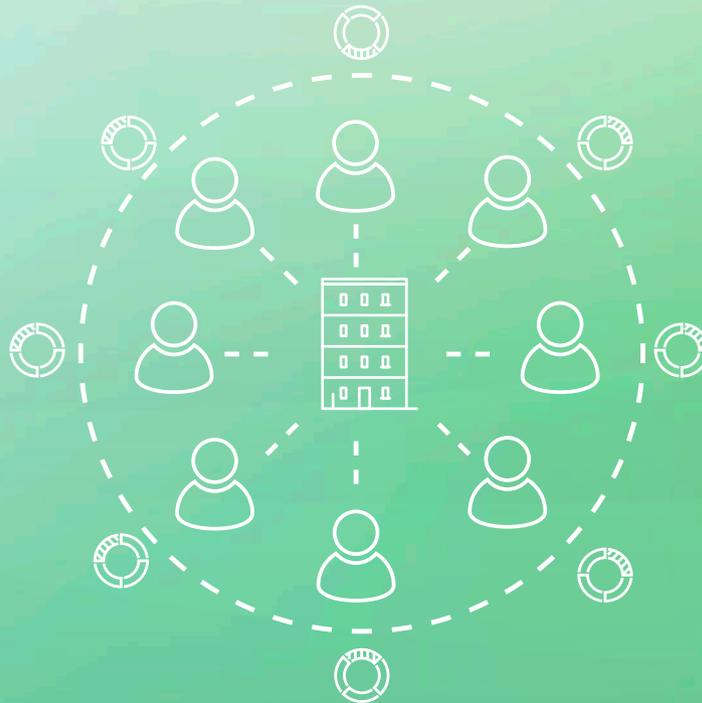
© Mutual Housing



MODEL 4: BUILDING COLLECTIVELY THROUGH COOPERATIVE HOUSING

In housing cooperatives, all inhabitants are members and financial shareholders of the cooperative that owns their property. This all-

ows for pooling of financial resources of its members, bringing down rental costs and making additional green investment viable.



HOUSING COOPERATIVES



EQUI-LIBRE | SWITZERLAND

Core activities

Equi-Libre cooperative provides affordable and sustainable housing with a collaborative, ecological and social vision in Geneva, Switzerland, one of the world's most expensive real estate markets.

Value proposition

Equi-Libre's offers:

- Below the market rate apartments in central locations
- High quality of living to its residents with some of the lowest energy consumption in the region, community and garden spaces, and car sharing systems among the residents.
- Participatory planning and design by future residents.

Customers

Residents range from single persons to families, spanning across all generations. Most residents are interested in the affordability of housing and life in a community. Households with low

incomes are eligible for rent support by the municipality.

Financing

Equi-Libre finances its activities through members' contributions as well as external financing. It leases land from the municipality in long-term lease agreements and constructs new apartment buildings through participatory planning processes. Apartments are then rented to its members. The construction costs are financed at 95% through a bank loan (for which the government gives a guarantee) and at 5% through their equity (members' contributions). Extensive implication of the residents in the construction process and in day-to-day activities assures low operating charges for the cooperative and contribute to a low fluctuation of residents. Rents are fixed to reimburse the bank loan and maintenance costs, thus having a tendency to decrease over time in comparison to the market rates. If tenants leave the apartment, they are reimbursed exactly the amount they contributed to the apartment upon joining the cooperative.



© Equi-Libre

Zoom on Resource Consumption

The apartment buildings all exceed local energy efficiency standards and

- Have some of the lowest thermal energy consumption per m² in the area (below 30 kWh/m²/year)
- Consume, on average, less than 1200 kWh/year electricity per household
- In the first apartment complex, water consumption is 60 l/person/year (in comparison to an average of more than 40 000 l/person/year, thanks to dry toilets)
- Individual car transport amounts to below 5000 km/year per household (in comparison to an average of 30 000 km/year/household) thanks to the car-sharing model and facilities for other modes of transports such as bicycles.

The key to this result is: usage of low embodied carbon materials such as wood, straw, clay and cellulose, generation of electricity and heat through renewable sources, usage of waste heat, reducing, reusing, and recycling of water i.e. through dry toilets.

*“Our rents are more affordable
and even decrease over time
in comparison to the market rates”*

Benoit Molineaux, Secretary General, Equi-Libre Cooperative





MODEL 5: GUARANTEEING ENERGY PERFORMANCE THROUGH ENERGY SUPPLY CONTRACTING

In energy supply contracting, a contractor plans, invests, constructs, and operates a heating/cooling installation and guarantees

a certain performance in return for annual payments by the user, usually resulting in units prices of energy lower than the market rate.



FRANK | GERMANY

Core activities

FRANK is a family-run real estate group with a business unit for energy contracting. It offers real estate developers to take on planning, investing, implementing, operating and maintaining of energy efficient heating and cooling systems for buildings. Since 2015, FRANK has developed 15 energy supply contracting projects for new builds (about 1100 apartments) of which half in cooperation with third party project developers. Its projects are financially viable through technological optimization. FRANK also proposes additional services such as on-site electricity generation and electrical mobility infrastructure.

Value proposition

- No capital costs for developer/owner for heating and cooling installations
- Risk reduction for the developer/owner for installations
- Easy compliance with mandatory renewable energy concepts for new builds
- Primary energy and CO₂ savings through highly energy efficient technologies.





Customers

- Internal development projects of FRANK
- Third party project developers

Financing

As early as possible, at design and energy supply concept development stage, FRANK proposes a heating and cooling concept for

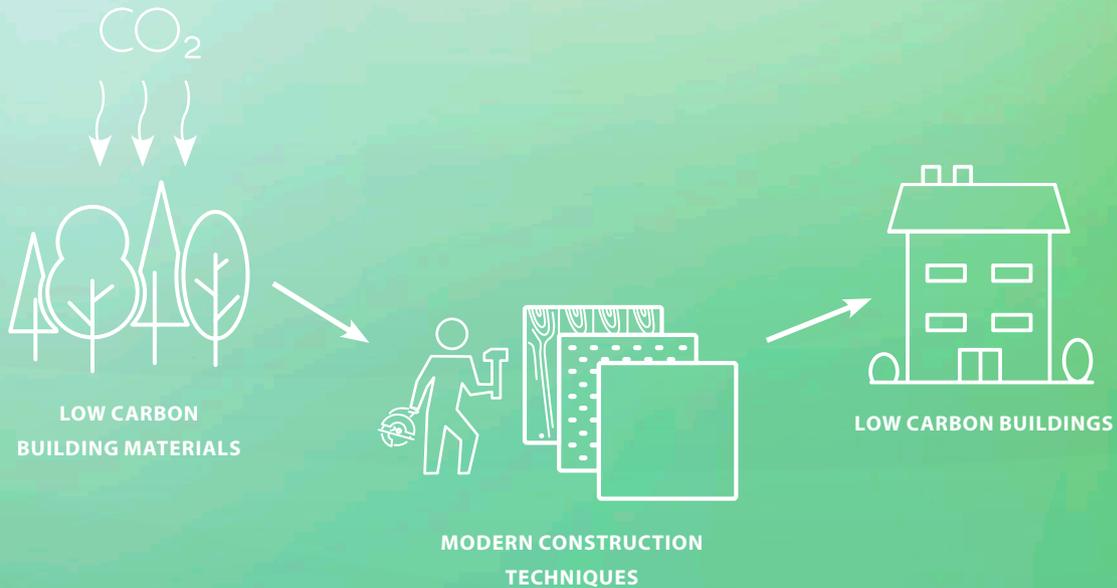
a property. It fully finances the investment and operating costs (using 20% equity as well as a commercial bank loan) and invoices the base fee as well as a usage-dependent part to the users (via the property manager) on an annual basis. The concluded energy supply contracts range from 10 to 15 years duration and are renewable. FRANK occasionally also enters joint ventures with project developers for implementation of its activities.





MODEL 6: BUILDING WITH LOW CARBON MATERIALS

Low emission construction materials depending on the local context represent an essential part of the building structure and of the value to customers through better health and environmental qualities.



WOODEUM | FRANCE

Core activities

Woodeum is a real estate developer specialized in low carbon solid wood apartment buildings. It was founded in 2014 based on the conviction of its founders of the potential for low carbon housing in reducing the emissions caused by the buildings and construction sector, and increasing the quality of life of its residents. Woodeum employs highly specialized engineers for the design and planning of its properties, and collaborates with suppliers of pre-fabricated wood panel products in Europe and renowned architects to provide state of the art wood buildings in well-connected urban areas. It has so far delivered 350 apartments, with construction ongoing for another 700. The rate of construction is accelerating in pace, with a further 1000 planned for 2020, and around 2000 apartments annually in the next three years.

Value proposition

Woodeum's value proposition encompasses:

- Low carbon construction, effectively creating carbon sinks,
- High environmental and architectural quality
- Better thermal comfort, interior air quality, and acoustic properties thanks to the intrinsic characteristics of wood
- Lower utility bills for heating

Woodeum also features a quicker construction process of on average six months, and its construction sites represent less nuisance to adjacent residents due to fewer truck movements.





© Woodeum

Customers

The clients of Woodeum apartments are very diversified and span all generations and forms of living. What they have in common is a desire to combine modern, high quality living with a low carbon footprint.

Financing

Woodeum was founded using equity and relies on commercial bank loans for its new developments. It does not rely on government subsidies. Sales prices per m² are similar to the market prices for conventional buildings.

For a wood structure building of 60m², the carbon “earnings” are roughly 30t CO₂ compared to conventional construction methods. In France, this is equivalent to 250 years of heating that same apartment with electricity, or driving 1,200 000 km!

“Building with wood is a highly specialized and future-oriented technique requiring more effort in the design and planning phases but construction itself can be done in a much shorter time period.”

Julien Pemezec, President of the Managing Board of Woodeum



KEY FEATURES OF SUCCESSFUL BUSINESS MODELS

Companies around the world have developed business answers to the market demand for more energy efficiency.

What they have in common is a strong strategic commitment to sustainability combined with the drive towards innovation, anticipating the demands of the future customers and giving their business a competitive edge. A common feature for innovative business models is their strong collaborative approach including other professionals. They go beyond their own specialization and work in partnership with companies from other fields such as engineers specializing in energy efficient technologies, landscaping experts, or mobility providers.

As companies, developers and operators alike, gain more experience with each project they implement, the energy performance of their portfolio improves, making the business case more viable with each step of experience gained.

IMPRINT

Publisher

Programme for Energy Efficiency in Buildings (PEEB)
Secretariat

c/o Agence Française de Développement (AFD)
5 Rue Roland-Barthes
75012 Paris, France

E info@peeb.build
T +33 (0) 1 53 44 35 28
I www.peeb.build

The Programme for Energy Efficiency in Buildings (PEEB) is currently funded by the *German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety* (BMU), the French *Ministère de la Transition écologique et solidaire* (MTES), the *Agence Française de Développement* (AFD) and the *Fonds Français pour l'environnement mondial* (FFEM). PEEB is catalysed by the *Global Alliance for Buildings and Construction* (GlobalABC).

PEEB is implemented by the *Agence de l'Environnement et de la Maîtrise de l'Énergie* (ADEME), AFD and *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) GmbH.

Author//Editor

Helen Naser

Design

Creative Republic, Frankfurt, Germany

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ABG Frankfurt Holding, Germany
Cooperative Equi-Libre, Switzerland
FRANK, Germany
Jochen Müller, Germany
Woodeum, France
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Status

May 2020

Funded by:

On behalf of:



of the Federal Republic of Germany



This project is part of the *International Climate Initiative* (IKI). The *German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety* (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag.

Implemented by:



Catalysed by:





PEEB

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**Programme for Energy Efficiency
in Buildings (PEEB) Secretariat**

c/o Agence Française de Développement (AFD)
5 Rue Roland-Barthes
75012 Paris, France

E info@peeb.build
T +33 (0) 1 53 44 35 28
I www.peeb.build